upon this point chiefly by Cajal and Van Gehuchten is, according to Golgi's view, purely theoretical and is not derived from any new facts discovered by them in nerve histology. The answer to this question is to be found where the reader is least likely to look for it, viz., in the last chapter and upon almost the last page of the book. This chapter is entitled, "Upon the origin of the fourth cranial nerve and a general question of cellular physiology which is connected with it." The particular point here is that the cells which give origin to the fourth nerve have a single neuron and no dendrons whatever. If on Cajal's hypothesis, that the dendrons are the organs of the nerve cells by which impulses are received and that the neuron furnishes the path for the discharge of the nerve impulse, how do cells like these having no trace of dendrons, receive stimuli? In order to bring the cells of the spinal ganglia into his system, Cajal has been obliged to suppose that the neuron to the skin is in reality to be considered a dendron. This, according to Golgi, is seriously straining facts to make them agree with theory.

The second important question upon which we desire to have Golgi's present opinion touches the relation of nerve cells to one another. Do their processes actually unite or do they merely come into contact? Golgi replies to this question with an entire chapter describing "The diffuse nervous network of the central organs of the nervous system and its physiological significance." In his former book he advances the view that the branches of the neurons unite to form a close-meshed network throughout the entire central gray matter. The great complexity of this structure made difficult the demonstration of actual union of processes from different cells; but Golgi now claims to have made preparations which leave no room for doubt. The contact theory has been so ably advocated of late by Ramon y Cajal, Kölliker, Van Gehuchten and others that this word from Golgi is most opportune. Golgi also insists more strongly than ever, if that is possible, upon the characteristic difference between neurons and dendrons, and to the objection of Obersteiner, that the Golgi method does not enable us to distinguish with certainty between these two kinds of processes, Golgi replies that this only proves that Obersteiner has never been able to obtain good preparations.

The bearing of Golgi's view on his conception of cerebral localization may be gathered from the emphasis which he places upon the fact that we have absolutely no subdivision of the cerebral cortex corresponding to the so-called "centres" of the localization school. No anatomical divisions exist, and in histological character the entire cortex is of essentially the same structure. In this there is no denial of a certain degree of localization. Regions, not sharply defined, into which a nerve enters directly or from which it most immediately springs, are naturally more distinctly concerned with its special function. But the presence of a diffuse nervous felt-work including the entire central gray matter must tend to bring us back toward something like the old position of Flourens, viz., that the entire brain, being a unit in structure, is also a unit in function.

Ueber ein neues Eintheilungsprincip der Grosshirnoberfläche. P. FLECHSIG. Neurologisches Centralblatt, XIII, p. 674, Leipzig, 1894.

The new division of the cerebral surfaces suggested by Professor Flechsig is the natural result of his long and eminently successful studies upon fiber systems in the brain and the order of their development in the child and human embryo. By these fiber-systems the cerebral hemispheres may be divided into two grand divisions. The first includes those areas which receive, or give origin to sensory or motor fibers (the sensory and motor areas of the localizationalists) besides a few

association fibres. The second great division of the brain has no direct connection whatever with the corona radiata, but contains only association fibres. For sake of brevity Flechsig designates the first class of areas as sensory centres, "Sinnescentren," and they include the optic area around the calcarine fissure, the auditory area in the posterior part of the first temporal convolution, the olfactory area in the hippocampal gyrus and the posterior part of the inferior surface of the frontal lobe, and last the great central motor region about the fissure of Rolando, including the posterior portions of the frontal convolutions.

The second great class of areas, the association centres, "Associationscentren," occupy the four great tracts, terra incognita, not accounted for by the locolizationalists. These are the anterior portion of the frontal lobe, the island, a large part of the temporal lobe, and a large region in the parieto-occipital lobe, including præcuneus and the posterior portion of the parietal lobe. The extent of these areas can best be determined in the brain of a three-months old child. At this age almost the entire corrona radiata is medulated, and these streams of medulated fibres spray out to distribute themselves solely in the sensory centres above described. Scarcely one-third of the cortex is thus supplied with medulated nerve fibres, and the large association areas comprising more than two-thirds of the entire brain surface are either entirely destitute of medulated fibres or contain only a few scattering fibres which come to them, for the most part, from the sensory centres. It would thus seem at this stage of development each sensory centre possessed its own sensory mechanism distinct from every other. Later, at what age it is not stated, each association centre develops association fibers which unite it with two or more sensory centres, and these fibers are much more numerous than fibers of association which unite sensory with sensory centres. The greatest difference, according to Professor Flechsig, between the brain of man and that of other animals is found in the enormous development of the association centres. Their development, in fact, determines the type of brain and the form of the skull.

Beitrag zur Lehre von der absteigenden Degeneration in Gehirn und Rückenmark und Bemerkungen über die Localization und die Leitungsbahnen der krämpfe bei der "Absynth-Epilepsie," ROBERT BOYCE. Neurologisches Centralblatt, Bd. XIII, p. 466, 5 figs.

Boyce has carried out a long series of experiments upon cats to determine first, the exact descending degenerations connected with the different operations, and, second, the locus, or loci, of origin for the convulsions in, "absynth-epilepsie." The following observations were made: 1. Extirpation of motor areas of one side. This is followed by degeneration of the corresponding pyramid, no other tract being implicated in the least. 2. Extirpation of one hemisphere, or, what amounts to the same thing, hemisection of the mid-brain. After this operation degeneration occurred in the descending root of the fifth nerve, in the posterior longitudinal bundle, both on the same side, and Meynert's and Forel's bundles of the opposite side. These degenerations were studied by Marchi's method and are made very clear by a well selected series of drawings.

Either directly after the operation, or after the animal had recovered, absynth was injected and a record was obtained upon the myograph from the extensor musles of both fore legs. Asymetrical epileptiform cramps were found to occur. If contractions had been wholly absent from the side corresponding to extirparion of the motor areas, this would have proved that these areas are the sole loci of origin for the convulsions. It was found, however, that centres exist in the medula and cerebellum which are capable of originating epileptiform cramps of the typical clonic character. The rhythm is, however, much slower than